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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,691	05/02/2005	Iwao Ushinohama	075834.00539	4568
33448	7590	07/17/2007	EXAMINER	
ROBERT J. DEPKE			STEVENOSKY, MARK J	
LEWIS T. STEADMAN				
ROCKEY, DEPKE & LYONS, LLC			ART UNIT	
SUITE 5450 SEARS TOWER			PAPER NUMBER	
CHICAGO, IL 60606-6306			2853	
			MAIL DATE	
			DELIVERY MODE	
			07/17/2007	
			PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/533,691

Applicant(s)

USHINOHAMA ET AL.

Examiner

Mark John Stevenosky, Jr.

Art Unit

2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 May 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 12/8/2005; 5/2/2005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Figure 22 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities: character reference 22 is referred to as "head cartridge 22" as well as "loading portion 22" on separate occasions.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

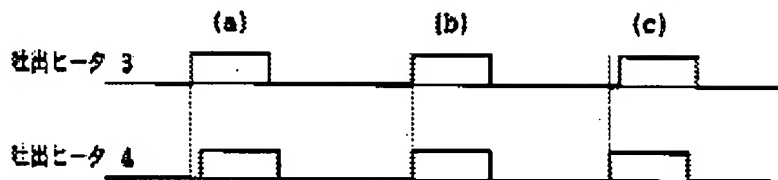
invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kazuyuki (JP 2001-105584).

Regarding **claims 1 and 4**, Kazuyuki discloses a liquid discharge apparatus [0029; Figure 1] comprising discharge control means [0037] including: a liquid chamber for storing liquid [Figures 3 and 4; although there is not a reference character specifically assigned to the liquid chamber, it can be clearly seen in the mentioned figures as the chamber which has above it heaters 3 and 4, as well as delivery 5 directly below]; two pressure generating elements or more provided at the liquid chamber [Figures 3 and 4; heaters 3 and 4; 0045-0046], and serving to press liquid stored within the liquid chamber [0045-0049]; and discharge holes [delivery 5] for discharging the liquid which has been pressed by the respective pressure generating elements in the state of droplet from the liquid chamber to control supply timings and supply times of energies to the respective pressure generating elements to control discharge angle when the droplet is discharged from the discharge hole [0045-0049]. Kazuyuki fails to *explicitly* disclose a 20% supply time as detailed in the claimed limitation.

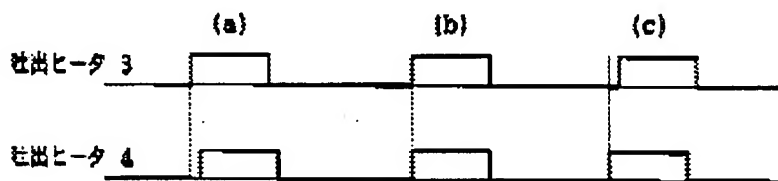
However, Kazuyuki teaches that the angle of ejection can be altered by changing the time at which a second heater fires after a first heater [0054-0055], thus the discharge direction of ink is controllable by shifting slight energization initiation timing of two heaters 3 and 4 [0054]. In addition, referencing Figure 5, the top timing diagram is for heater 3 whereas the lower diagram is for heater 4. Second heater 4 is activated a short period of time afterward.

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Thus, it would have required *only* routine skill in the art by means of routine experimentation to arrive at a 20% supply time, in view of Kazuyuki. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Kazuyuki, as doing so would provide straight flight of ink [0052].

Regarding **claims 2 and 5**, Kazuyuki fails to *explicitly* disclose a range of 7.5% to 20%. However, Kazuyuki teaches that the angle of ejection can be altered by changing the time at which a second heater fires after a first heater [0054-0055], thus the discharge direction of ink is controllable by shifting slight energization initiation timing of two heaters 3 and 4 [0054]. In addition, referencing Figure 5, the top timing diagram is for heater 3 whereas the lower diagram is for heater 4. Second heater 4 is activated a short period of time afterward.



Thus, it would have required *only* routine skill in the art by means of routine experimentation to arrive at a 7.5% to 20% supply time, in view of Kazuyuki. Thus, it

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would have been obvious to one of ordinary skill in the art at the time of invention to modify Kazuyuki, as doing so would provide straight flight of ink [0052].

Regarding **claims 3 and 6**, Kazuyuki discloses nozzles in substantially parallel form [Figure 7].

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- US 6,918,656 [See Figure 10A-B].
- US 2007/0008380 [Figure 16] discloses a method of improving drop angle by altering current values.
- US 6,325,492 [Figure 20A] discloses offset periods for separate heaters.
- US 6,913,345 discloses heater offsets [see Figure 2].
- US 6,488,350 discloses heater offsets between a rear heater and a front heater [see Figure 1].
- US 6,382,768 discloses time pulses offsets for two heaters [see Figures 5A-D]
- US 6,375,309 discloses delayed timing of rear heaters to front heaters [see Figures 16A-C, 18A-C].
- US 6,471,337 discloses heater driving pulse offsets [see Figure 2].
- US 6,464,329 discloses heater timing patterns [see Figure 12].

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark John Stevenosky, Jr. whose telephone number is (571) 270-1336. The examiner can normally be reached on Monday - Friday, 9AM - 5:30PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



7/11/2007

Mark John Stevenosky, Jr.
Examiner
Art Unit 2853



MANISH S. SHAH
PRIMARY EXAMINER